The Corps
of
Royal Canadian Electrical and Mechanical Engineers

The Olafson Infantry Footbridge

By

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The RCEME Heritage Archives

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During the Second World War, the campaign in Italy was marked by the need to cross many rivers. While some were major obstacles, many were relatively small and could be crossed using light infantry assault boats. The boats, however, could not transport light vehicles, such as the jeep, and the supporting heavy weapons of the infantry battalions, such as their 6-pounder anti-tank guns. These had to wait until the Royal Canadian Engineers bridged the gap, which could leave the infantry unsupported in the bridgehead for hours, or even cause the loss of the bridgehead to a counterattack. The infantry battalions needed a method of quickly getting their support weapons and supplies across an obstacle.

On 1 November 1944, the 3rd Canadian Infantry Brigade was withdrawn from the front line and into a rest area near Cattolica, Italy. The brigade commander, Brigadier J.P.E. Bernatchez, then asked Captain A.E. Olafson, commanding No. 3 Light Aid Detachment (LAD), RCEME, that supported the brigade, to look into the possibility of developing a footbridge that would allow infantry to cross a 30-foot gap, or a jeep across a 15-foot gap. The LAD was a small unit, about 16 men, who performed first-response light repairs and maintenance on the vehicles and equipment in the brigade.

Captain Olafson and his Armament Quartermaster Sergeant, C.C Houghtaling, considered several possible designs, and finally decided on a 15-foot triangular structure. This would be built of ⅞-inch mild steel pipe, and would be two feet wide and eighteen inches deep at the apex. Two or more sections could be joined by using two ⅝-inch round steel tension rods that fitted into holes at the end of the each section.

The bridge was assembled upside down, and when the spans were complete, the end junctions were wrapped with kapok floats (life preservers) and the span floated across the gap. The bridge was attached to a holdfast on each bank and when possible supported at the section junctions by 10-foot long extending jacking posts sitting on an 18-inch diameter supporting base. A hand rail was attached. To carry a jeep, two bridges were built side-by side and connected by spacing bars. Duckboards were placed on top of the spans to spread the load from the wheels.

The pilot model was built by 3 LAD personnel, who were also in their rest period and had half their personnel on leave. Brigadier Bernatchez approved the design, and ordered six sections built in order to test them thoroughly. Although the job was too big for an LAD, (the war diary contains a fair amount of grumbling) it was decided to continue the work in the LAD until it could be proven that the bridge would turn out satisfactorily. At that point, the demand for it would have sufficient priority to get help from supporting workshops that were already busy with essential work.

When three 15-foot sections were completed, they were launched across the Concha River. The bridge was light, strong, and easy to assemble, and Brigadier Bernatchez and the officers of 3 CIB ware highly enthusiastic. A good deal of attention was attracted, and welders and equipment from the supporting RCEME workshop were sent to 3 LAD in order to finish the remaining spans in the shortest possible time for a major demonstration. AQMS Houghtaling was in charge of production and ensured that the workmanship was of high quality and a credit to RCEME. Brigadier Bernatchez and Lieutenant-Colonel J.V. Allard (commanding officer of the R22eR) contributed many ideas to the project, particularly in regard to accessories (footing plates, uprights, jacks, etc).

Brigadier Bernatchez had 3 LAD reinforce the sections that had been already made, as he intended to use them for jeep crossings. The sections had originally been built with the minimum of bracing for lightness as a footbridge, and required reinforcing for use as a jeep bridge. The drawing shows the reinforced spans with extra pipe added and plate reinforcing webs welded at the narrow end sections.

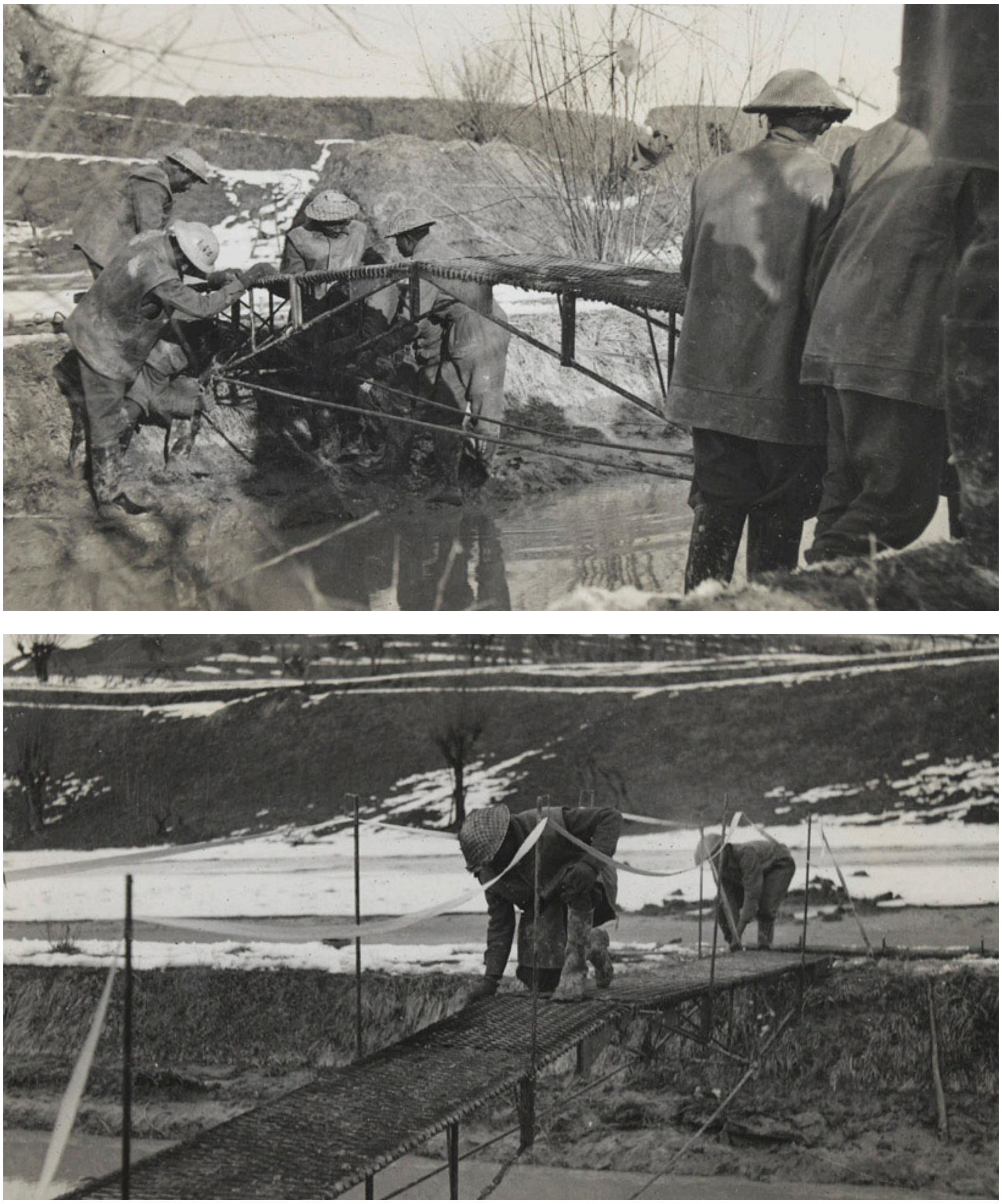
A 60-foot footbridge (four 15-foot sections end-to-end) and a 30-foot jeep bridge were demonstrated before a large group of Canadian corps and divisional officers on 22 November 1944. After the demonstration, the Corps Commander announced that each infantry battalion in the corps would be equipped with a six-section Olafson Infantry Footbridge, complete with accessories, in the shortest possible time. This finally expanded the project to the point that it became a workshop-level production problem and the LAD thankfully returned to their normal duties. The war diary entry for 30 November notes that they were back to normal.

Headquarters, RCEME, 1st Canadian Infantry Division, organized an ad-hoc bridge production company commanded by Captain Martin. The company was composed of some 45 personnel, and all the welding equipment that could be made available from fifteen different units in the division. The bridges were built in record time, one for each battalion, and was used successfully in the crossing of the Lamone River and Naviglio Canale in early December 1944.

Formal drawings for the construction of the bridge were created in late December (see Annex A). No Canadian photos of the bridge have been found, but the bridge obviously was taken up by the British and other Commonwealth forces, because there are photos of Indian Sappers constructing the bridge.

The bridge was not intended as an assault bridge, but rather for use in reinforcing a bridgehead quickly and acting as a temporary crossing until the engineers could get more permanent structures erected (which could be four to seven hours after a bridgehead was won). It gave the battalion commander his own bridge, under his control, assembled by his battalion pioneer section as and when required. As such, it was extremely popular.

Captain A.E. Olafson and Armament Quartermaster Sergeant C.C Houghtaling were both appointed Members of the Order of the British Empire (MBE) for their work on the bridge.



Indian engineers construct an Olafson footbridge during the Italian Campaign in 1944. National Army Museum, London, UK.

Sources

DeMaio, Lieutenant Colonel A. *A History of RCEME in 1 Canadian Infantry Division, Central Mediterranean Force, 19 November 1943 to 21 March 1945*. RCEME Guild.

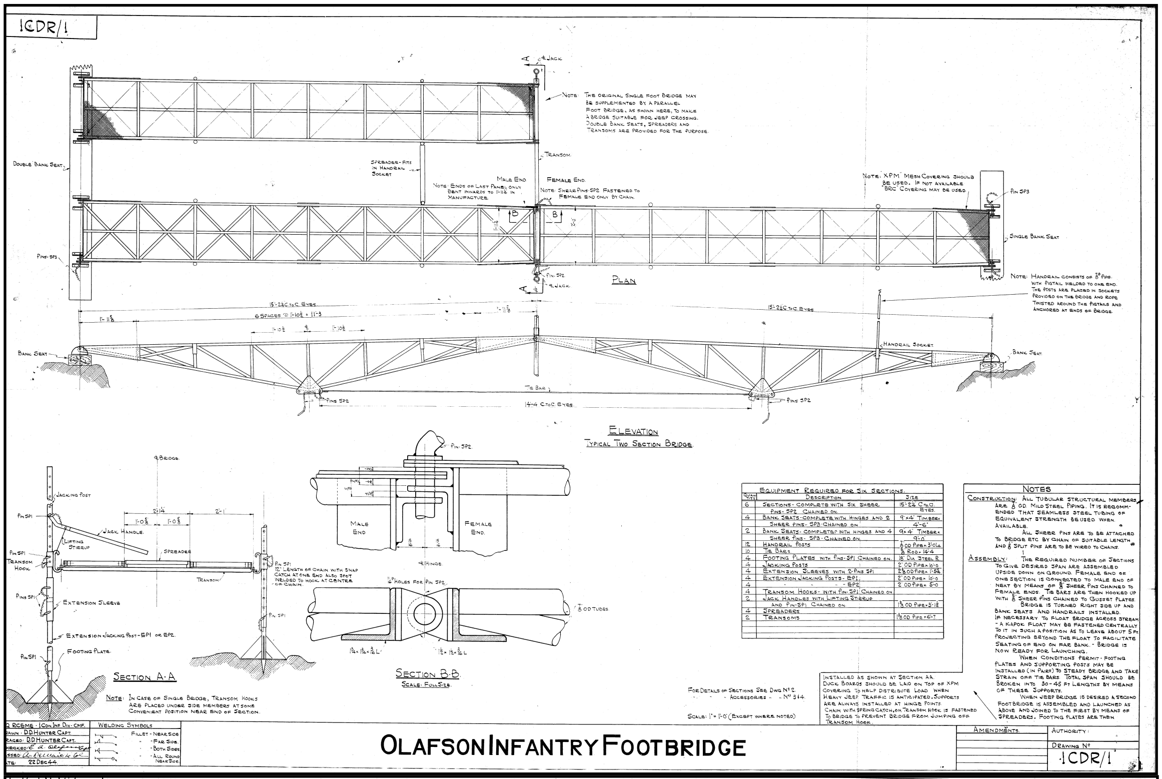
War Diary, No. 3 Light Aid Detachment, RCEME, November 1944. (Copy in the RCEME Archives, CFB Borden, Ontario.)

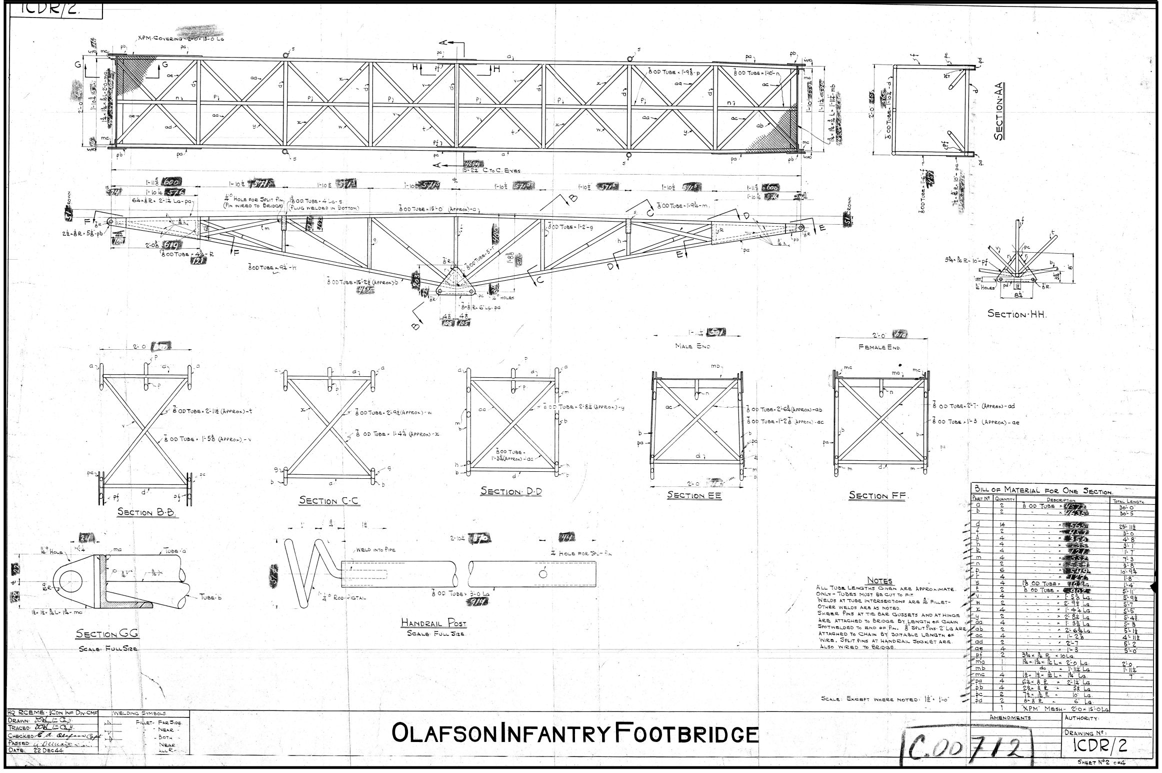
Drawings, Olafson Foot Bridge. (Copy in the RCEME Archives, CFB Borden, Ontario.)

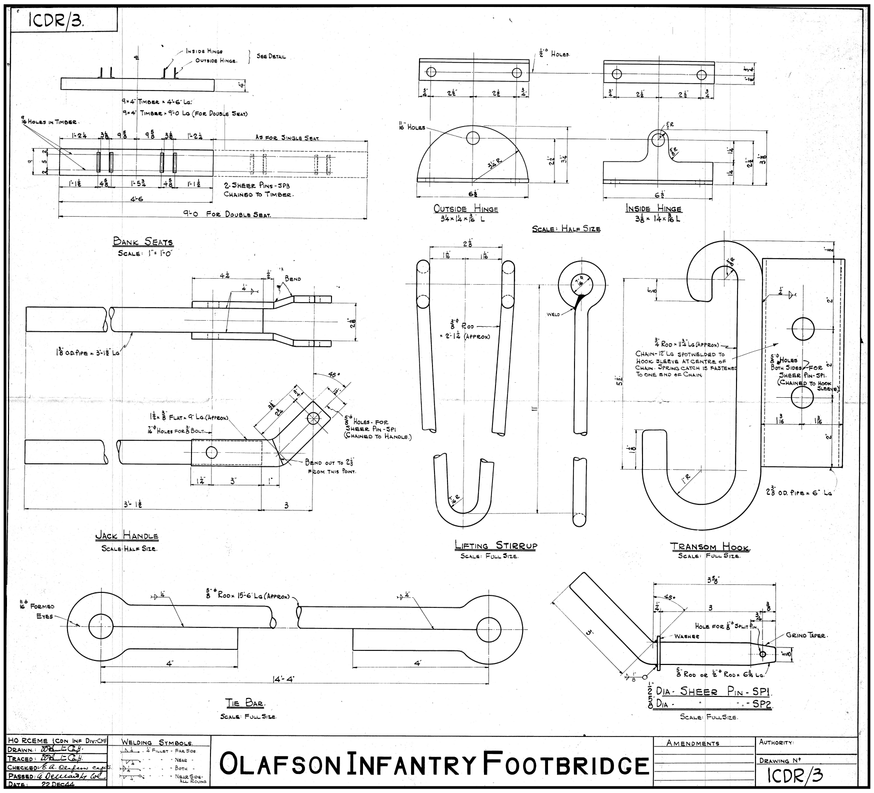
Photos, National Army Museum, London, UK.

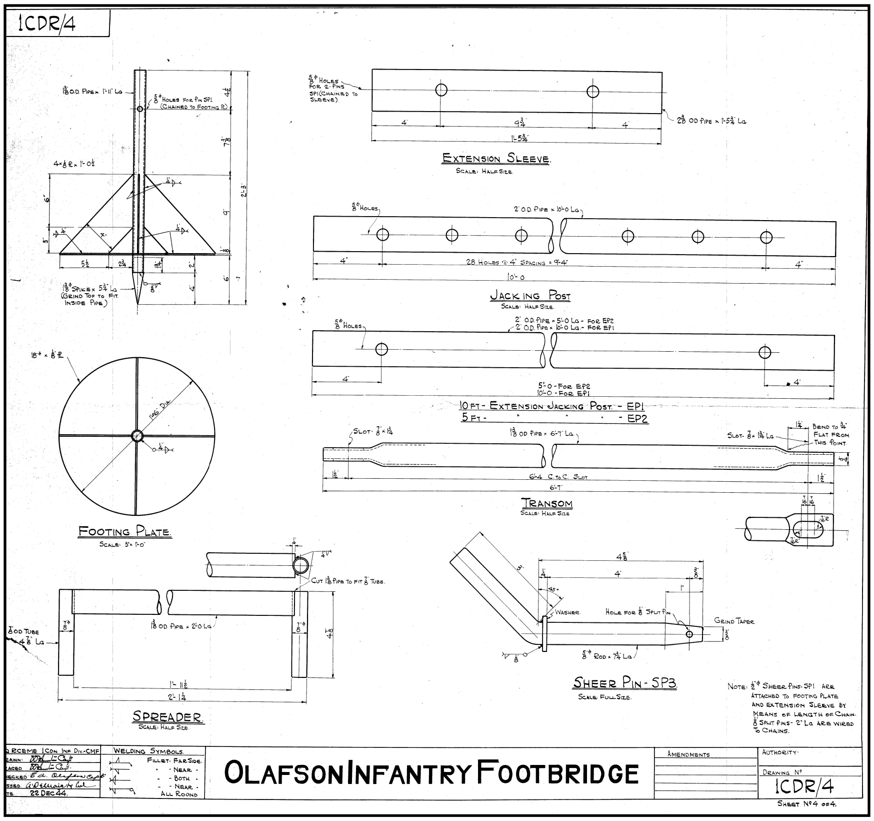
Annex A - Drawings

The drawings (blueprints) for the bridge are in the RCEME Archives in Canadian Forces Base Borden, Ontario.






ICDR/3.
Inside Hinge
Outside Hinge. } See Detail
9×4" Timber × 4'-6" Lg.
9×4" Timber × 9'-0 Lg (For Double Seat)
9/16 Holes in Timber.
As for Single Seat.
2-Sheer Pins-SP3 Chained to Timber.
4'-6
9'-0 For Double Seat.
Bank Seats
Scale: 1" = 1'-0"
1/2" Holes.
11/16" Holes
Outside Hinge
3 1/4 × 1 1/4 × 3/16" L
Inside Hinge
3 3/8 × 1 1/4 × 3/16 L
Scale: Half Size
Bend
1 3/8" O.D. Pipe × 3'-1 1/2" Lg
1 1/2 × 3/8" Flat × 9" Lg. (Approx)
7/16" Holes for 3/8" Bolt
5/8" Holes - for Sheer Pin-SP1 (Chained to Handle.)
Bend out to 2 1/3" from this Point.
Jack Handle
Scale: Half Size.
3/8" Rod × 2'-1 1/4 (Approx)
Weld
Lifting Stirrup
Scale: Full Size.
3/4" Rod × 11 3/4" Lg (Approx)
Chain-12" Lg spotwelded to Hook Sleeve at centre of Chain. Spring catch is fastened to one end of Chain.
5/8" Holes Both Sides - for Sheer Pin-SP1. (Chained to Hook Sleeve)
2 3/8" O.D. Pipe × 6" Lg
Transom Hook.
Scale: Full Size.
11/16" Formed Eyes
5/8" Rod × 15'-6" Lg (Approx)
14'-4"
Tie Bar.
Scale: Full Size.
Washer
Hole for 1/8" Split Pin
Grind Taper.
5/8" Rod or 1/2" Rod × 6 3/4 Lg.
1/2" Dia - Sheer Pin - SP1.
5/8" Dia - " " - SP2.
Scale: Full Size.
HQ RCEME 1 Cdn Inf Div-CMF
Drawn: D.D. Hunter Capt.
Traced: D.D. Hunter Capt.
Checked: E.A. Olafson Capt.
Passed: A. DeMaio Lt Col.
Date: 22 Dec 44
Welding Symbols.
1/4" Fillet - Far Side.
" - Near -
" - Both -
" - Near Side - All Round
Olafson Infantry Footbridge
Amendments
Authority:
Drawing No.
ICDR/3


ICDR/4
1 3/8" O.D. Pipe × 1'-11" Lg
5/8" Holes for Pin SP1 (Chained to Footing Pl.)
4 × 1/8" Pl. × 1'-0 1/2
1 3/8" Spike × 5 3/4" Lg (Grind top to fit inside Pipe)
18" × 1/8" Pl.
1'-6" Dia.
Footing Plate.
Scale: 3" = 1'-0"
5/8" Holes for 2 Pins SP1 (Chained to Sleeve)
2 3/8" OD Pipe × 1'-5 3/4" Lg
1'-5 3/4"
Extension Sleeve.
Scale: Half Size.
5/8" Holes
2" O.D. Pipe × 10'-0 Lg
28 Holes @ 4" Spacing = 9'-4"
10'-0
Jacking Post
Scale: Half Size.
2" O.D. Pipe × 5'-0 Lg - for EP2
2" O.D. Pipe × 10'-0 Lg - for EP1
5'-0 - For EP2
10'-0 - For EP1
10 ft - Extension Jacking Post - EP1
5 ft - " " " - EP2
Slot - 7/8" × 1 3/4
1 3/8 OD Pipe × 6'-7" Lg.
Slot - 7/8 × 1 3/4" Lg
Bend to 3/4" Flat from this Point.
6'-4 C. to C. Slot
6'-7"
Transom
Scale: Half Size
Cut 1 3/8 Pipe to fit 7/8" Tube.
7/8 OD Tube 4 7/8" Lg
1 3/8 OD Pipe × 2'-0 Lg
1'-11 1/2
2'-1 1/4
Spreader.
Scale: Half Size.
Washer.
Hole for 1/8" Split Pin
Grind Taper
5/8" Rod × 7 3/4" Lg
Sheer Pin - SP3.
Scale: Full Size.
Note: 1/2" Sheer Pins-SP1 are attached to Footing Plate and Extension Sleeve by means of length of Chain. 1/8" Split Pins - 2" Lg are wired to Chains.
HQ RCEME 1 Cdn Inf Div-CMF
Drawn: D.D. Hunter Capt.
Traced: D.D. Hunter Capt.
Checked: E.A. Olafson Capt.
Passed: A. DeMaio Lt Col.
Date: 22 Dec 44.
Welding Symbols.
Fillet - Far Side.
" - Near -
" - Both -
" - Near - All Round
Olafson Infantry Footbridge
Amendments
Authority:
Drawing No.
ICDR/4
Sheet No 4 of 4.